

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Robert F. Wallace
Assignee: SanDisk Corporation
Title: Semiconductor Package Using Terminals Formed on a
Conductive Layer of a Circuit Board
Serial No.: Unassigned Filed: May 24, 2001
Examiner: Unknown Group Art Unit: Unknown
Docket No.: M-10238-2C US

San Francisco, California
May 24, 2001

BOX PATENT APPLICATION
ASSISTANT COMMISSIONER FOR PATENTS
Washington, D. C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the above-identified continuation patent application as follows:

IN THE SPECIFICATION

Please amend the specification by inserting on Page 1, line 4, before "Field of the
Invention" the following heading and added paragraph:

--CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation of U.S. Application Serial No. 09/487,106, filed January
19, 2000, entitled "Semiconductor Package Using Terminals Formed on a Conductive
Layer of a Circuit Board" by Robert F. Wallace which is a divisional of U.S.
Application Serial No. 09/906,140 filed on June 11, 1998, now U.S. Patent No.

6,040,622 issued March 21, 2000, which application and patent are incorporated herein in their entirety by this reference.--

IN THE CLAIMS

Please amend the claims as follows:

Cancel Claims 1-36, and substitute the following new claims.

--37. (new) A memory card comprising:

a circuit board having an exposed rear side, a covered front side, and edges, the exposed side having a conductive layer of the circuit board exposed to form contact terminals arranged in only one row and positioned away from an edge of the circuit board, the covered side comprising at least one integrated circuit including flash memory, circuit traces, and passive components, the circuit board also having vias connecting the contacts of the exposed side with the integrated circuit and circuit traces of the covered side; and

a one piece cover over the front side and edges of the circuit board, such that the rear side of the circuit board is exposed to form substantially all of the rear side of the memory card.

38. (new) The memory card of claim 37 wherein the integrated circuit is encapsulated directly onto the front side of the circuit board.

39. (new) The memory card of claim 37, wherein the cover material includes molded plastic.

Table 1. Demographic characteristics of the study population	
Age (years)	65.0 ± 10.0
Gender	
Male	50 (50.0%)
Female	50 (50.0%)
Education (years)	12.0 ± 2.0
Marital status	
Married	40 (80.0%)
Single	10 (20.0%)
Occupation	
Retired	30 (60.0%)
Unemployed	20 (40.0%)
Income (USD/month)	1000.0 ± 500.0
Health status	
Good	30 (60.0%)
Poor	20 (40.0%)
Comorbidities	
Hypertension	15 (30.0%)
Diabetes	10 (20.0%)
Cholesterol	12 (24.0%)
Arthritis	8 (16.0%)
Other	5 (10.0%)

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a one piece cover encasing the covered side and edges but not the exposed side of the circuit board.

46. (new) The memory card of claim 45, wherein the integrated circuit is encapsulated directly onto the front side of the circuit board.

47. (new) The card of claim 45, wherein the cover is attached to the covered side of the circuit board by epoxy.

48. (new) The card of claim 45, wherein the cover is attached to the covered side and edges of the circuit board by injection molding.

49. (new) The card of claim 45, wherein on the exposed side of the card, the set of terminals is the only electrical component exposed.

50. (new) The card of claim 45, wherein the circuit elements include at least two integrated circuits and passive devices.

51. (new) A circuit board having a front side, a back side, and edges:
the back side of the circuit board exposed and having contacts, the contacts exposed flush with the back side of the circuit board and positioned away from an edge of the circuit board, the contacts being the only electrical components on the back side of the circuit board;
and

the front side covered and comprising a set of circuit elements on the circuit board, the set of circuit elements comprising at least one integrated circuit having flash EEPROM, and passive components;

wherein the circuit board is a memory storage device.

52. (new) The circuit board of claim 51, wherein the contacts are formed from a conductive layer of the circuit board.

53. (new) The circuit board of claim 52, wherein the contacts are arranged in only one row.

54. (new) The circuit board of claim 51, wherein the cover includes molded plastic.

55. (new) The circuit board of claim 51, wherein the cover extends around the perimeter of the circuit board but does not cover the exposed face of the circuit board.

56. (new) The circuit board of claim 51, wherein the contacts on the front side are connected to the set of circuit elements on the backside by vias.

57. (new) A package comprising:

a circuit board;

contact terminals on a first side of the circuit board;

one or more integrated circuits, passive components, and circuit traces on a second side of the circuit board, one or more of the integrated circuits comprising nonvolatile memory;

wherein the first side of the circuit board forms substantially all of a first side of the package; and

packaging material surrounding the integrated circuits and passive devices,

wherein the packaging material forms the second side of the package;

wherein the package itself, without further integration, forms a memory card.

58. (new) The package of claim 57, wherein the contact terminals of the first side of the package are spaced away from the edge of the package.

59. (new) The package of claim 58, wherein the contact terminals are substantially flush with the first side of the package.

60. (new) The package of claim 58, wherein the contact terminals are in one row.

61. (new) The package of claim 60, wherein the contact terminals have a leading edge and a trailing edge, and wherein one or more contact terminals of the row of contact terminals has a leading edge positioned ahead of the leading edge of the remainder of the row of contact terminals.

62. (new) A memory card comprising:

a circuit board having an exposed rear side, a covered front side, and edges, the exposed side having a conductive layer of the circuit board exposed to form contact terminals arranged in only one row and positioned away from a first edge of the circuit board, the

covered side comprising at least one integrated circuit including flash memory, circuit traces, and passive components, the circuit board also having vias connecting the contacts of the exposed side with the integrated circuit and circuit traces of the covered side; and

a one piece cover over the front side and edges of the circuit board, such that the rear side of the circuit board is exposed to form substantially all of the rear side of the memory card,

wherein the circuit traces comprise test connections located on a portion of the circuit board that is removed after testing but before the one piece cover is affixed to the circuit board.

63. (new) The memory card of claim 62, wherein the row of contact terminals is parallel to the first edge and positioned proximally to the first edge of the circuit board, and wherein the test connections are positioned at a second edge of the circuit board, said second edge and said test connections positioned distally from said first edge.--

REMARKS

Early and favorable acceptance of this Application is respectfully requested. The Examiner is invited to call Applicant's attorney at (415) 217-6000 if there are any questions.

EXPRESS MAIL LABEL NO:
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Respectfully submitted,



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